II. AMENDMENTS TO THE CLAIMS

1. (Currently amended) A method of sealing a subterranean zone comprising:

preparing a cement composition comprising a cementitious material, a polymer emulsion comprising at least one polar monomer and at least one elasticity enhancing monomer, and a mixing fluid;

placing the cement composition into the subterranean zone; and

allowing the cement composition to set therein, wherein the polar monomer and the elasticity enhancing monomer are present in the polymer emulsion in relative amounts effective to increase the elasticity of the set cement composition compared to a neat cement composition, while providing the set cement composition with a strength sufficient to seal the subterranean zone.

2. (Original) The method of claim 1 wherein the cement composition further comprises silica flour.

3. (Currently amended) The method of claim 1 wherein the cementitious material is selected from the group consisting of Portland ~~cemerit~~ cement, pozzolan cement, gypsum cement, aluminous cement, silica cement, and phosphate cement.

4. (Original) The method of claim 1 wherein the at least one polar monomer is selected from the group consisting of vinylamine, vinyl acetate, acrylonitrile, acrylic acid, and acid, ester, amide and salt forms of acrylates.

5. (Original) The method of claim 1 wherein the at least one elasticity enhancing monomer is selected from the group consisting of ethylene, propylene, butadiene, 1,3-hexadiene and isoprene.

6. (Original) The method of claim 1 wherein the polymer emulsion comprises from about 1 to about 90 weight percent of the at least one polar monomer and from about 10 to about 99 weight percent of the at least one elasticity enhancing monomer.

7. (Original) The method of claim 1 wherein the polymer emulsion further comprises at least one stiffness enhancing monomer.

8. (Original) The method of claim 7 wherein the at least one stiffness enhancing monomer is selected from the group consisting of styrene, t-butylstyrene, α-methylstyrene and sulfonated styrene.

9. (Original) The method of claim 7 wherein the polymer emulsion comprises up to about 70 weight percent of the at least one stiffness enhancing monomer.

10. (Original) The method of claim 1 wherein the polymer emulsion is present in an amount of from about 0.1 to about 30 percent by weight of the cementitious material.

11. (Original) The method of claim 1 wherein the mixing fluid comprises water in an amount of from about 30 to about 150 percent by weight of the cementitious material.

12. (Original) The method of claim 1 wherein the polymer emulsion is present in an amount of from about 2 to about 6 percent by weight of the cementitious material and the mixing fluid comprises water in an amount of from about 30 to about 70 percent by weight of the cementitious material.

13. (Currently amended) The method of claim 1 wherein the cement composition further comprises a polymer emulsion stabilizing surfactant.

14. (Original) The method of claim 1 wherein the cement composition further comprises a defoaming agent.

15. (Original) The method of claim 1 further comprising, prior to the preparing of the cement composition, evaporating water from the polymer emulsion such that the polymer emulsion becomes a dry polymer additive.

16. (Original) The method of claim 15 wherein the dry polymer additive is present in an amount of from about 2 to about 6 percent by weight of the cementitious material and the mixing fluid comprises water in an amount of from about 30 to about 150 percent by weight of the cementitious material.

17. – 37. (Canceled)

38. (Currently amended) A method of sealing a subterranean zone comprising:

preparing a cement composition comprising a cementitious material, ~~a dry polymer additive prepared by evaporating water from~~ a polymer emulsion comprising at least one polar monomer selected from the group consisting of vinylamine, vinyl acetate, acrylonitrile, acrylic acid and acid, ester, amide or salt forms of acrylates and at least one elasticity enhancing monomer selected from the group consisting of ethylene, propylene, butadiene, and 1,3-hexadiene and isoprene, and a mixing fluid;

placing the cement composition into the subterranean zone; and

allowing the cement composition to set therein, wherein the polar monomer and the elasticity enhancing monomer are present in the polymer emulsion in relative amounts effective to increase the elasticity of the set cement composition compared to a neat cement composition, while providing the set cement composition with a strength sufficient to seal the subterranean zone.

39. – 40. (Canceled)

41. (Original) The method of claim 38 wherein the polymer emulsion further comprises at least one stiffness enhancing monomer.

42. (Original) The method of claim 38 wherein the at least one stiffness enhancing monomer is selected from the group consisting of styrene, t-butylstyrene, α-methylstyrene and sulfonated styrene.

43. (Currently amended) A method for manipulating at least one mechanical property of a set cement composition comprising:

~~selecting an amount of at least one polar monomer and at least one elasticity enhancing monomer suitable to contribute to at least one mechanical property of a set cement composition;~~

preparing a cement composition comprising a cementitious material, a polymer emulsion comprising ~~the~~ at least one polar monomer and ~~the~~ at least one elasticity enhancing monomer, and a mixing fluid; and

allowing the cement composition to set, wherein the polar monomer and the elasticity enhancing monomer are present in the polymer emulsion in relative amounts effective to reduce the Young's modulus of the set cement composition compared to a neat cement composition, while providing the set cement composition with at least a compressive strength sufficient to seal a subterranean zone.

44. (Original) The method of claim 43 wherein the cementitious material is selected from the group consisting of Portland cement, pozzolan cement, gypsum cement, aluminous cement, silica cement, and phosphate cement.

45. (Original) The method of claim 43 wherein the at least one polar monomer is selected from the group consisting of vinylamine, vinyl acetate, acrylonitrile, acrylic acid and acid, ester, amide or salt forms of acrylates.

46. (Original) The method of claim 43 wherein the at least one elasticity enhancing monomer is selected from the group consisting of ethylene, propylene, butadiene, 1,3-hexadiene and isoprene.

47. (Original) The method of claim 43 wherein the polymer emulsion comprises from about 1 to about 90 weight percent of the at least one polar monomer and from about 10 to about 99 weight percent of the at least one elasticity enhancing monomer.

48. (Original) The method of claim 43 wherein the polymer emulsion further comprises at least one stiffness enhancing monomer.

49. (Original) The method of claim 48 wherein the at least one stiffness enhancing monomer is selected from the group consisting of styrene, t-butylstyrene, α-methylstyrene and sulfonated styrene.

50. (Original) The method of claim 48 wherein the polymer emulsion comprises up to about 70 weight percent of the at least one stiffness enhancing monomer.

51. (Original) The method of claim 43 wherein the polymer emulsion is present in an amount of from about 0.1 to about 30 percent by weight of the cementitious material.

52. (Original) The method of claim 43 wherein the mixing fluid comprises water in an amount of from about 30 to about 150 percent by weight of the cementitious material.

53. (Original) The method of claim 43 wherein the polymer emulsion is present in an amount of from about 2 to about 6 percent by weight of the cementitious material and the mixing fluid comprises water in an amount of from about 30 to about 150 percent by weight of the cementitious material.

54. (Currently amended) The method of claim 43 wherein the ~~mechanical property manipulated is at least one of compressive strength, tensile strength and Young's modulus,~~ the polar monomer and the elasticity enhancing monomer are present in relative amounts effective to provide the set cement composition with a tensile strength sufficient to resist applied tensile stresses in the subterranean zone.

55. (Currently amended) The method of claim 43 wherein the at least one polar monomer comprises acrylonitrile and the at least one elasticity enhancing monomer comprises butadiene, ~~the method further comprising selecting an amount of butadiene sufficient to contribute a desired property to the set cement composition, wherein the desired property is selected from the group consisting of Young's modulus, compressive strength and tensile strength~~.

56. (New) A method of sealing a subterranean zone comprising:

preparing a cement composition comprising a cementitious material, a polymer emulsion, and a mixing fluid;

placing the cement composition into the subterranean zone; and

allowing the cement composition to set therein,

wherein the polymer emulsion comprises at least one polar monomer selected from the group consisting of vinylamine, vinyl acetate, acrylonitrile, and acid, ester, amide or salt forms of acrylates and at least one elasticity enhancing monomer, and

wherein the polar monomer and the elasticity enhancing monomer are present in the polymer emulsion in relative amounts effective to increase the elasticity of the set cement composition compared to a neat cement composition, while providing the set cement composition with a strength sufficient to seal the subterranean zone.

57. (New) The method of claim 56 wherein the cement composition further comprises at least one of silica flour, a polymer emulsion stabilizing surfactant and a defoaming agent.

58 (New) The method of claim 56 wherein the cementitious material is selected from the group consisting of Portland cement, pozzolan cement, gypsum cement, aluminous cement, silica cement, and phosphate cement.

59. (New) The method of claim 56 wherein the at least one elasticity enhancing monomer is selected from the group consisting of ethylene, propylene, butadiene, 1,3-hexadiene and isoprene.

60. (New) The method of claim 56 wherein the polymer emulsion comprises from about 1 to about 90 weight percent of the at least one polar monomer and from about 10 to about 99 weight percent of the at least one elasticity enhancing monomer.

61. (New) The method of claim 56 wherein the polymer emulsion further comprises at least one stiffness enhancing monomer.

62. (New) The method of claim 61 wherein the at least one stiffness enhancing monomer is selected from the group consisting of styrene, t-butylstyrene, α-methylstyrene and sulfonated styrene.

63. (New) The method of claim 61 wherein the polymer emulsion comprises up to about 70 weight percent of the at least one stiffness enhancing monomer.

64. (New) The method of claim 56 wherein the polymer emulsion is present in an amount of from about 0.1 to about 30 percent by weight of the cementitious material.]

65. (New) The method of claim 56 wherein the polymer emulsion is present in an amount of from about 2 to about 6 percent by weight of the cementitious material and the mixing fluid comprises water in an amount of from about 30 to about 70 percent by weight of the cementitious material.

66. (New) A method of sealing a subterranean zone comprising:

preparing a cement composition comprising a cementitious material, a polymer emulsion comprising at least one polar monomer and at least one elasticity enhancing monomer, and a mixing fluid;

placing the cement composition into the subterranean zone; and

allowing the cement composition to set therein,

wherein the polymer emulsion is present in an amount of from about 0.1 to about 30 percent by weight of the cementitious material;

wherein the polymer emulsion comprises from about 1 to about 90 weight percent of the at least one polar monomer and from about 10 to about 99 weight percent of the at least one elasticity enhancing monomer; and

wherein the polar monomer and the elasticity enhancing monomer are present in the polymer emulsion in relative amounts effective to increase the elasticity of the set cement composition compared to a neat cement composition, while providing the set cement composition with a strength sufficient to seal the subterranean zone.

67. (New) The method of claim 66 wherein the at least one polar monomer is selected from the group consisting of vinylamine, vinyl acetate, acrylonitrile, acrylic acid, and acid, ester, amide and salt forms of acrylates.

68. (New) The method of claim 66 wherein the at least one elasticity enhancing monomer is selected from the group consisting of ethylene, propylene, butadiene, 1,3-hexadiene and isoprene.

69. (New) The method of claim 66 wherein the polymer emulsion further comprises at least one stiffness enhancing monomer.

70. (New) The method of claim 69 wherein the at least one stiffness enhancing monomer is selected from the group consisting of styrene, t-butylstyrene, α-methylstyrene and sulfonated styrene.

71. (New) The method of claim 70 wherein the polymer emulsion comprises up to about 70 weight percent of the at least one stiffness enhancing monomer.

72. (New) The method of claim 66 wherein the polymer emulsion is present in an amount of from about 2 to about 6 percent by weight of the cementitious material and the mixing fluid comprises water in an amount of from about 30 to about 70 percent by weight of the cementitious material.

73. (New) The method of claim 66 wherein the cement composition further comprises at least one of a polymer emulsion stabilizing surfactant, a defoaming agent and silica flour.

74. (New) The method of claim 66 wherein the cementitious material is selected from the group consisting of Portland cement, pozzolan cement, gypsum cement, aluminous cement, silica cement, and phosphate cement.